

CLAIMS

1. / A diene polymer rubber composition comprising:

(A) 100 parts by weight of a raw material rubber comprising (A-1) a diene rubbery polymer which is a conjugated diene rubbery polymer or a conjugated diene-styrene rubbery copolymer, said diene rubbery polymer

(1) containing a modified component in an amount exceeding 60 wt.%, which modified component is obtained by reacting an active end of the rubbery polymer with a polyfunctional compound having, in its molecule thereof, at least two epoxy groups,

(2) having a molecular weight distribution M_w/M_n of 1.05 to 3.0, and

(3) having a weight-average molecular weight of 100,000 to 2,000,000; and, based on 100 parts by weight of the component (A),

(B) 1 to 100 parts by weight of a rubber extension oil;

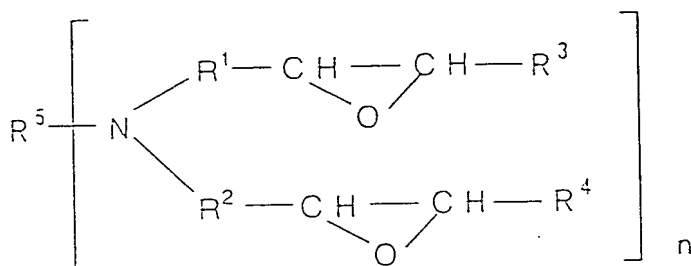
(C) 25 to 100 parts by weight of reinforcing silica; and

(D) 1.0 to 20 parts by weight in total of a vulcanizing agent and a vulcanizing accelerator.

2. The diene polymer rubber composition according to

claim 1, wherein the polyfunctional compound further has at least one nitrogen-containing group.

3. The diene polymer rubber composition according to claim 1, wherein the polyfunctional compound is represented by the following formula:



wherein R^1 and R^2 each independently represents a C_{1-10} hydrocarbon group or a C_{1-10} hydrocarbon group having at least one group selected from ethers and tertiary amines, R^3 and R^4 each independently represents hydrogen, a C_{1-20} hydrocarbon group or a C_{1-20} hydrocarbon group having at least one group selected from ethers and tertiary amines, R^5 represents a C_{1-20} hydrocarbon group, a C_{1-20} hydrocarbon group having at least one group selected from ethers, tertiary amines, epoxy, carbonyl and halogens, and n stands for 1 to 6.

4. The diene polymer rubber composition according to claim 3, wherein the polyfunctional compound has, in its

molecule thereof, at least one diglycidylamino group.

5. The diene polymer rubber composition according to claim 1, wherein the content of the modified component of the component (A-1) has been analyzed by chromatography.

6. The diene polymer rubber composition according to claim 1, further containing 0.1 to 20 wt.%, based on the weight of the component (C), of (E) an organosilane coupling agent.

7. The diene polymer rubber composition according to claim 1, which further contains (F) 0.1 to 100 parts by weight of carbon black, the total amount of the components (C) and (F) being from 30 to 150 parts by weight.

8. The diene polymer rubber composition according to claim 7, wherein the amount of the component (F) is 0.1 parts by weight or greater but less than 25 parts by weight.

9. The diene polymer rubber composition according to claim 1, wherein the component (A-1) has a molecular weight distribution M_w/M_n (2) of 1.05 or greater but less than 2.2.

10. The diene polymer rubber composition according to claim 1, wherein the component (A) comprising 15 to 99 wt.% of the component (A-1) and 1 to 85 wt.% of component (A-2) which is a vulcanizable rubbery polymer other than the component (A-1).

11. A diene polymer rubber vulcanizate obtained by: conducting initial kneading, at least once under the conditions permitting kneading discharging temperature of 135 to 180°C, of an initial kneading component comprising:

(A) 100 parts by weight of a raw material rubber comprising (A-1) a diene rubbery polymer which is a conjugated diene rubbery polymer or a conjugated diene-styrene rubbery copolymer, said diene rubbery polymer

(1) containing a modified component in an amount exceeding 60 wt.%, which modified component is obtained by reacting an active end of the rubbery polymer with a polyfunctional compound having, in its molecule thereof, at least two epoxy groups,

(2) having a molecular weight distribution of Mw/Mn of 1.05 to 3.0, and

(3) having a weight-average molecular weight of 100,000 to 2,000,000; and, based on 100 parts by weight of the component (A),

(B) 1 to 100 parts by weight or a rubber extension oil; and

(C) 25 to 100 parts by weight of reinforcing silica, to thereby obtain an initial kneaded mass having a rubber bound content after kneading of 30 to 70 wt.%;

adding, to 100 parts by weight of the component (A), (D) 1.0 to 20 parts by weight in total of a vulcanizing agent and a vulcanizing accelerator; and

kneading the resulting mixture to give a kneading discharging temperature of 120°C or less, thereby vulcanizing.

12. The diene polymer rubber vulcanizate according to claim 11, wherein the initial kneading component further contains at least one of 0.1 to 20 wt.% of (E) an organosilane coupling agent based on the weight of the component (C) and 0.1 to 100 parts by weight of (F) carbon black based on 100 parts by weight of the component (A).

13. The diene polymer rubber vulcanizate according to claim 11, wherein the component (A) comprises 15 to 99 wt.% of the component (A-1) and (A-2) 1 to 85 wt.% of a vulcanizable rubbery polymer other than the component (A-1).

14. The diene polymer rubber vulcanizate according to claim 12, wherein the amount of the component (E) is 0.1 wt.% or greater but less than 6 wt.% based on the amount of the component (C).

15. The diene polymer rubber vulcanizate according to claim 11, wherein initial kneading is carried out to give the below-described kneading discharging temperature (Td) depending on a heating loss (Mo) of the component (C).

- 1) $135 \leq T_d \leq 180^{\circ}\text{C}$ when $1\% \leq \text{Mo} \leq 4\%$
- 2) $(15 \times \text{Mo} + 75)^{\circ}\text{C} < T_d \leq 180^{\circ}\text{C}$ when $4\% < \text{Mo} \leq 6\%$ and
- 3) $165^{\circ}\text{C} < T_d \leq 180^{\circ}\text{C}$ when $6\% < \text{Mo} \leq 10\%$.

Add B17